

In Flight USA

Testing the Limits: Experimental Test Pilot Bruce Hinds

By ZQ TAYLOR

Before Bruce Hinds made aviation history as the first pilot to fly the Northrop B-2 Spirit, he was an Air Force aviator, who likes to say that he was the Academy's first commuter. Growing up a stone's throw from Lowry Air Force Base, Colorado, a young Hinds knew he wanted to fly. After graduation in 1957 from East High School in Denver, he received an appointment from Congressman Byron Rogers to the Air Force Academy, which was originally housed at Lowry before permanently moving to its currently location in Colorado Springs.

"I was in the Academy's third graduating class. We started with a little over 300 students—everyone was physically qualified to fly, and 217 of us graduated. When I joined the Air Force, there were a thousand B-47s in the inventory. Classes are a lot bigger now, and the inventory is quite different," recalls Hinds.

Academy cadets flew orientation rides in T-28s and T-34s jet planes. Graduates, including Hinds, were often dual- or triple-rated as pilots, bombardiers, and navigators in those days. Today the B/N designation is combined. A year after graduation from the Academy in 1961 with a Bachelor of Science in Metallurgy, Hinds earned his flying wings at Vance AFB, Oklahoma, flying the twin-engine T-37s and single engine T-33s jets.

Hinds was next checked out in the Lockheed C-130 Hercules and soon flying operational tours out of Goose Bay AB, Labrador, in the C-130Hs equipped with Fulton Recovery Systems. He also participated in NASA's Gemini spacecraft recoveries.

"The C-130 took us out of the piston engine into the new turbo-prop design, a pretty fancy airplane at that time. I logged many hours in that plane, flying to places like Easter Island and South America, chasing the recovery system balloons," says Hinds.

Galaxys, Dragonflies, and Missiles

Hinds graduated USAF Test Pilot School in 1968 as a 27-year-old captain and was lucky enough to be assigned a project right away. He worked as the project pilot for the Lockheed C-5 Galaxy out of Pope AFB, testing and setting a few world airdrop records.



Northrop Chief Test Pilot Bruce Hinds flew the maiden flight of the Northrop B-2 Spirit stealth bomber (AV-1, 82-1066) on July 17, 1989, out of USAF Plant 42, Site 4, Palmdale, CA (sfah)

"Defense Secretary McNamara wanted it to do everything, the Air Force, and the Army wanted it to do everything so we tested everything on the C-5, even though many functions were not implemented operationally. I also flew a version of the C-130 in Vietnam a couple of years later, and by that time, the planes had 30,000 hours on them," says Hinds, who received the Distinguished Flying Cross for air operations over Laos and North Vietnam, along with three Air Medals and two Meritorious Service Medals.

Back from combat and stationed at Edwards AFB, Hinds continued to build what became a reputation for excellent testing. He tested countless programs and systems, such as Cessna A-37 Dragonfly probe and drogue air refueling systems, McDonnell Douglas KC-10 and Boeing

KC-135 Stratotanker qualifications, Boeing E-3 AWACS air worthiness testing, and U-2 modifications including a D model, serial number 56-6682, which is on display at the Robins Museum of Aviation in Georgia.

Before retiring from the Air Force in 1982, Lieutenant Colonel Hinds had flown most of the inventory and held numerous operations and strategic positions, participating in significant aviation advancements. He's flown more than 12,000 hours with many in single-seater fighters such as the F-16, F-104, and U-2, and multi-engine bombers and transporters including the B-52 and B-57. He also was the C-5 project pilot for the Minuteman missile launch mission that became instrumental during strategic arms reduction negotiations with the former Soviet



Union.

Built under the Carter Administration, the B-2 bomber was America's choice for fighting the Cold War. Precision radar and all-composite construction helped make the B-2 capable of bombing 16 targets in a single pass while carrying 1,000- or 2,000-pound bombs or 80 targets when equipped with 500-pound bombs. (USAF)

The Knock at the Door

“My career at Northrop literally began with a knock at the door one night. From the recruiter at the door to the mysterious interview held at the CarBarn parking lot near Los Angeles Airport, it was all cloaked in secrecy,” remembers Hinds, who had been recruited to work on the Northrop B-2 Spirit, the most expensive plane ever built, and a momentous milestone in the modernization of stealth bomber aircraft. “And it was pretty much like that until first flight. We worked in an unspecified building; we couldn't say what we were doing, where we were going.”

After US President Carter publicly cancelled the B-1A bomber program in 1977, he secretly authorized the start of a stealth bomber program,

the Advanced Technology Bomber (ATB), to replace both the B-1A and the B-52. Still plagued by the Cold War era, the Carter administration wanted to develop low-observable bombers that could penetrate Soviet airspace undetected for hundreds of miles with a full load of nuclear weapons. Northrop, Boeing, and Lockheed were frontrunners for designing the stealth aircraft. Northrop's design was based on its early XB-35 and the YB-49 projects, becoming a pure flying wing with no rudder, no tail.

In October 1981, Northrop was awarded the secret ATB contract for 6 flying aircraft, 2 static test aircraft, and an option for 132 production bombers. Working with partners Boeing and Ling-Temco-Vought (which was later acquired by Northrop), the design responsibilities were assigned, Northrop maintaining primary control of design, assembly, and production.

Testing the B-2 Bomber

“The first time I saw the drawings in early 1982, I was with the engineers at the initial briefing. It was a flying wing concept and they were asking about the directional stability and questioning aerodynamics issues. There was no tail, and I was thinking, ‘Gee, didn't we forget something?’” recalls Hinds. “Before the first flight in 1989, we worked on it for nearly eight years to ensure that it would fly like an airplane.”

During the development of the B-2, Hinds and the design crew would regularly and secretly fly back and forth between Los Angeles and Seattle's Boeing facility to use wind tunnels and simulators between 10pm and 2am when the plant was empty. The first B-2, unveiled as AV-1, 82-1066, was revealed to the public in November 1988, even though it was not ready yet for its first flight. After the magnificent bomber was rolled out, Hinds did the first flight and initial flight testing for envelope expansion.

He piloted the maiden flight of 82-1066, later christened the Spirit of America when it became an operational aircraft, with Colonel Richard Couch, on July 17, 1989, out of USAF Plant 42, Site 4, Palmdale, California. Their test flight concluded 112 minutes later with a successful landing at Edwards AFB. Subsequent radar cross-section testing was completed before the AV-1 was stowed to await configuration for the operational fleet. The second test aircraft, Spirit of Arizona (AV-2, 82-1067), was first flown on

October 19, 1990, heavily instrumented and serving as a loads test plane.



First flight of B-2 bomber (AV-1, 82-1066), later christened Spirit of America, flown by Hinds with co-pilot Col. Richard Couch. Their test flight concluded 112 minutes later with a successful landing at Edwards AFB. (USAF)



The B-2 (cockpit) was the first aircraft equipped with color, nine-tube, electronic flight instrument systems and multi-purpose panels for displaying flight, engine, and sensor data, and avionics systems and weapons status. (USAF)

After flight testing the first two B-2 bombers, Hinds took his hands-on experience deep into the production projects to get the next four aircraft ready for the test flight program. The original order for 132 was reduced to 75 after the Eastern bloc fell. With the dissolution of the Soviet Union in 1991 and thus the Cold War, the US need for stealth bombers seemed less urgent and the government proposed canceling the program. Because it was cheaper to finish the aircraft in the jigs, 21 B-2 stealth bombers were built.

The B-2 can travel over 6,000 nm without refueling and spirited a lot of firsts: it was the first aircraft with color multi-purpose panel displays, and the first plane with all-composite wings and structures, which contributed to the plane's stealth capabilities. Part of the \$24 billion spent on B-2 research and design helped to develop new component technologies,

including flight control actuators which had to move at 100 degrees per second to keep the tailless plane nimble but stable. This was 10 times the normal actuator speeds of 10 degrees per second.

With APQ-181 precision radar that operates as a GPS-aided smart guidance tail kit, the B-2 is capable of bombing 16 targets in a single pass while carrying 1000- or 2000-pound bombs, or 80 targets when equipped with 500-pound bombs.

No Such Thing as Retired

Hinds received the Iven C. Kincheloe Award in 1990 from the Society of Experimental Test Pilots for his outstanding work on the B-2 flight test program. He stayed with the B-2 program until 1993, then spent two years working on other classified programs at Northrop. After completing yet another illustrious aviation career, he retired in 1995, but then forged a consulting business. Working mainly with the Defense Advanced Research Projects Agency (DARPA), an organization of the US Department of Defense, Hinds was integrally involved in the development of two unmanned aerial vehicles, the RQ- DarkStar and the RQ-4 Global Hawk surveillance plane.



The Northrop B-2 Spirit stealth bomber is a low-observable, strategic, long-range, heavy bomber capable of penetrating sophisticated and dense air-defense shields. Listed as the most expensive plane ever built, the B-2 bomber program spent \$24 billion on research and development of new technologies and approximately \$1 billion for each of the 21 airplanes built.

Reflecting on the trends and achievements in aviation over the last four decades, Hinds notes that while airplanes continue to cost more, they can do more. “There were a lot more test projects and many more companies building aircraft 30 and 40 years ago. We don’t see many new airplanes anymore. Being in the test business now means getting into one aircraft and staying with that for quite awhile,” he says.

When asked to reflect on his own experiences, a broad smile comes across Hinds’ face and he says, “Well, I never had to bail out, but I used to drive to work down Interstate-5 in Los Angeles—and I observed a lot more death and destruction than I ever saw in 35 years of test flying.”